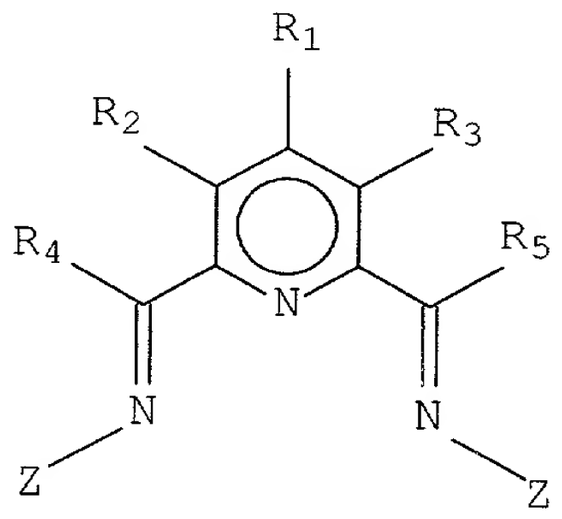
WE CLAIM:

1. A process for production of higher linear alpha olefins and/or alkyl-branched alpha olefins, which comprises the co-oligomerisation of one or more alpha olefins with ethylene in the presence of a metal catalyst system employing one or more bis-aryliminepyridine MX_a complexes and/or one or more [bis-aryliminepyridine $MY_p.L_b^+][NC^-]_q$ complexes, said bis-aryliminepyridine complexes comprising a ligand of the formula,

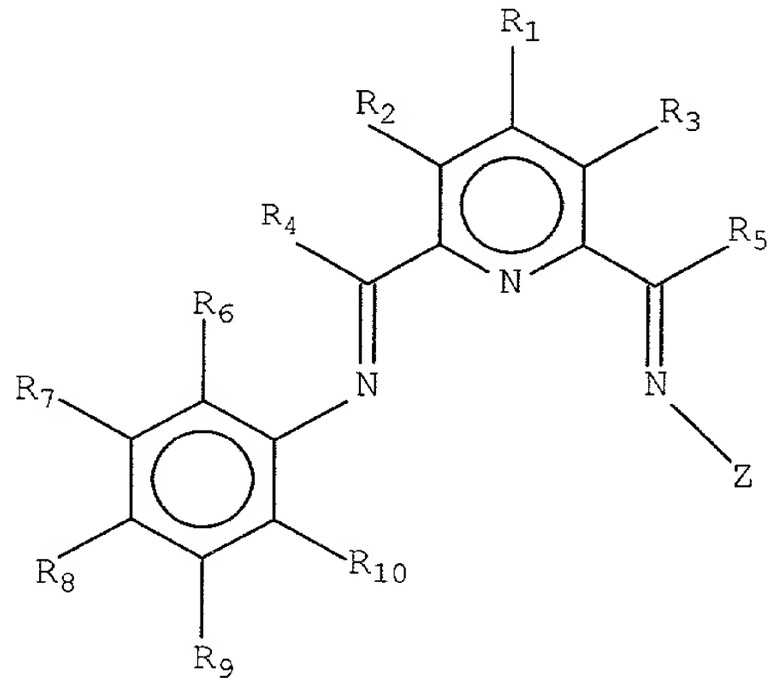


(I)

wherein M is a metal atom selected from Fe or Co; a is 2 or 3; X is halide, optionally substituted hydrocarbyl, alkoxide, amide, or hydride; Y is a ligand which may insert an olefin; NC^- is a non-coordinating anion; p+q is 2 or 3, matching the formal oxidation of said metal atom; L is a neutral Lewis donor molecule; b = 0, 1, or 2; R_1-R_5 are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R_1-R_3 vicinal to one another taken together may form a ring; each Z, which may be identical or different, is an optionally substituted aromatic hydrocarbon ring; an optionally substituted polyaromatic

hydrocarbon moiety; an optionally substituted heterohydrocarbyl moiety; or an optionally substituted aromatic hydrocarbon ring in combination with a metal, said optionally substituted aromatic hydrocarbon ring being π-co-ordinated to the metal; and said process is carried out at an ethylene pressure of less than 2.5 MPa.

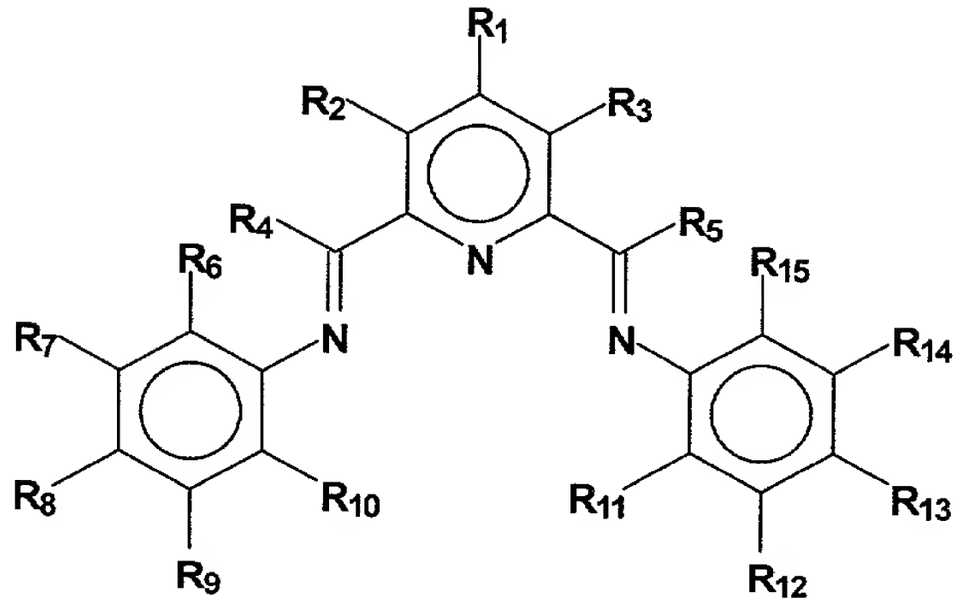
2. The process of Claim 1 wherein said ligand is of the formula,



(II)

wherein R_1-R_{10} are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R_1-R_3, R_6-R_{10} vicinal to one another taken together may form a ring; R_6 may be taken together with R_4 to form a ring; R_{10} may be taken together with R_4 to form a ring; Z is an optionally substituted aromatic hydrocarbon ring; an optionally substituted polyaromatic hydrocarbon moiety; an optionally substituted heterohydrocarbyl moiety; or an optionally substituted aromatic hydrocarbon ring in combination with a metal, said optionally substituted aromatic hydrocarbon ring being π-co-ordinated to the metal.

3. The process of Claim 1 wherein said ligand is of the formula,



(III)

wherein R_1-R_5, R_7-R_9 and R_{12}-R_{14} are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R_1-R_3, R_7-R_9 and R_{12}-R_{14} vicinal to one another taken together may form a ring; R_6 is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R_7 or R_4 to form a ring; R_{10} is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R_9 or R_4 to form a ring; R_{11} is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R_5 or R_{12} to form a ring; and R_{15} is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R_5 or R_{14} to form a ring.

4. The process of Claim 3 wherein R_1-R_5, R_7-R_9 and R_{12}-R_{14} are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or

any two of R_1-R_3, R_7-R_9 and R_{12}-R_{14} vicinal to one another taken together may form a ring; R_6 is a primary carbon group, a secondary carbon group or a tertiary carbon group; and provided that:

when R_6 is a primary carbon group none, one or two of R_{10}, R_{11} and R_{15} are primary carbon groups, and the remainder of R_{10}, R_{11} and R_{15} are hydrogen;

when R_6 is a secondary carbon group none or one of R_{10}, R_{11} and R_{15} is a primary carbon group or a secondary carbon group and the remainder of R_{10}, R_{11} and R_{15} are hydrogen;

when R_6 is a tertiary carbon group all of R_{10}, R_{11} and R_{15} are hydrogen; and

any two of R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, R_{14} and R_{15} vicinal to one another, taken together may form a ring.

5. The process of Claim 3 wherein R_1-R_5, R_7-R_9 and R_{12}-R_{14} are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R_1-R_3, R_7-R_9 and R_{12}-R_{14} vicinal to one another taken together may form a ring; R_6 is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R_7 or R_4 to form a ring; R_{10} is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R_9 or R_4

to form a ring; R_{11} and R_{15} are, independently, hydrogen or an inert functional group.

6. The process of Claim 3 wherein R_1-R_5, R_7-R_9 and R_{12}-R_{14} are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R_1-R_3, R_7-R_9 and R_{12}-R_{14} vicinal to one another taken together may form a ring; R_6, R_{10}, R_{11} and R_{15} are identical and are each selected from fluorine or chlorine.

7. The process of Claim 1 wherein alpha olefin co-monomer is generally present in a concentration of greater than 1 $mol.l^{-1}$.

8. The process of Claim 2 wherein alpha olefin co-monomer is generally present in a concentration of greater than 1 $mol.l^{-1}$.

9. The process of Claim 3 wherein alpha olefin co-monomer is generally present in a concentration of greater than 1 $mol.l^{-1}$.

10. The process of Claim 4 wherein alpha olefin co-monomer is generally present in a concentration of greater than 1 $mol.l^{-1}$.

11. The process of Claim 5 wherein alpha olefin co-monomer is generally present in a concentration of greater than 1 $mol.l^{-1}$.

12. The process of Claim 6 wherein alpha olefin co-monomer is generally present in a concentration of greater than 1 $mol.l^{-1}$.

13. A composition comprising linear alpha olefins and/or alkyl branched alpha olefins produced by the process of Claim 1.

14. The composition of Claim 13 wherein said alkyl-branched alpha olefins are methyl- and/or ethyl-branched alpha olefins.

15. A composition comprising linear alpha olefins and/or alkyl-branched alpha olefins, wherein said composition contains greater than 5 % wt. alkyl-branched alpha olefins based on the total weight of linear alpha olefins and alkyl-branched alpha olefins in the product composition.

16. The composition of Claim 15 wherein said allyl-branched alpha olefins are methyl- and/or ethyl branched alpha olefins.